

IN THE SPECIFICATION:

Please amend the paragraph beginning at line 19 of page 129 as follows:

---FIGs. 69, 70 and 71 show three other embodiments of hybrid active electronic and optical circuits 6502. FIGs. 69, 70, and 71 are each top views of their respective devices. The basic purpose of each of the hybrid active electronic and optical circuits 6502 shown in FIGs. 69, 70, and 71 is to couple light from a relatively wide (i.e., greater than 100  $\mu\text{m}$ ) input waveguide 6901 into a relatively narrow (i.e., less than 3  $\mu\text{m}$ ) waveguide 6904. ~~The tapered~~ A gap region 6906b is used to evanescently couple light into waveguide 6904. The three FIGs. 69, 70, and 71 show three different ~~techniques~~ passive optical elements that may be used to accomplish the task of changing the direction of incident light within relatively wide input waveguide 6902 into an angle suitable for evanescent coupling into relatively narrow waveguide 6904. These deflection angles can be computed using computational tools such as FDTD.---

Please amend the paragraph beginning at line 2 of page 130 as follows:

---In the embodiment of FIG. 69, ~~deviation~~ deflection is due to a grating 6902 being integrated into the Si layer during manufacture. In the case of FIG. 70, a waveguide prism 7002 created by altering the effective mode index of the Si layer in a manner such that the shape of a prism is created. In the embodiment of FIG. 71, a waveguide lens 7102 is used. The relatively narrow waveguide 6904 may contain an active optical device.---

Please amend the paragraph beginning at line 6 of page 130 as follows:

---During (or before/after) the deposition of the desired silicon and electrical insulators in the active electronic portion 6504, the optical insulator materials are deposited in ~~the~~ an insulator strip 6906a and evanescent coupling region 6906b. In accordance with the present invention, evanescent coupling region 6906b may be formed to include a tapered gap portion, or a uniformly shaped gap portion, and may comprise a thickness on the order of 0.5  $\mu\text{m}$ . Similarly, the etching of the silicon material for, and deposition of the desired material to form, the active electronic portion 6504 can occur simultaneously with the corresponding etching and deposition of the materials to form the

passive optical portion 6506. The waveguide 6904 may additionally be considered as a passive optical portion.---

Please amend the paragraph beginning at line 13 of page 130 as follows;

---The embodiment of hybrid active electronic and optical circuit 6502 shown in FIG. 69 includes a waveguide grating 6902 to couple impinging light from relatively wide input waveguide 6901 into the relatively narrow waveguide 6904 through evanescent coupling region 6906b. The waveguide grating 6902 is configured such that impinging light 6920 from relatively wide input waveguide 6901 is deflected at a suitable angle so the deflected light 6922 enters the relatively narrow waveguide 6904 at a suitable mode angle  $\theta_M$ . The waveguide grating 6902 is a passive optical portion 6506, and can be controlled by active electronics 6504 to control the angle of deflection, as described herein. Alternatively, the waveguide grating 6902 can be configured as a purely passive device that deflects the light being applied to the waveguide 6904 to the mode angle.---

Please amend the paragraph beginning at line 21 of page 130 as follows:

---FIG. 70 shows another embodiment of hybrid active electronic and optical circuit 6502 shown in FIG. 69, except that the waveguide prism 7002 has been incorporated in place of the waveguide grating 6902. Similarly, the waveguide prism 7002 is a passive device, that deflects the light being applied to the waveguide 6904 in a mode angle  $\theta_M$ . The use of the active electronic component 6504 allows adjustability of the light flowing through the waveguide prism 7002, thereby allowing light flowing through the waveguide prism 7002 to be controllably directed at a desired controllable angle to the relatively narrow waveguide 6904.---

Please amend the paragraph beginning at line 3 of page 131 as follows:

---The material of waveguide prism 7002, the active electronic portion 6504, and the insulator strip 6906a and evanescent coupling region 6906b can all be etched, and the corresponding layers deposited, simultaneously. Different photoresists and masks may allow different materials to be deposited in each of the areas being etched, however, a

sequence of all the deposition steps and etching steps that comprise all the processes performed on all of the optical portions and electronic portions, may be performed simultaneously. If a specific material is being deposited on one portion (but not another), or etched on one portion (but not another), then the corresponding masks and etching or deposition tools will be configured accordingly. FIG. 71 shows another embodiment of hybrid active electronic and optical circuit 6502 in which full waveguide lens 7102 is formed in the upper most silicon layer of the SOI wafer 6600 in place of the waveguide prism 7002 shown in the embodiment of FIG. 70.---